REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

1. REPORT DATE *(DD-MM-YYYY)*	**2. REPORT TYPE**	**3. DATES COVERED** *(From - To)*
15-03-2011	Proceedings	24-08-2010 to 26-08-2010

4. TITLE AND SUBTITLE

Proceedings of the 2010 AFMS Medical Research Symposium. Volume 5. Nursing Track: Abstracts and Presentations

5a. CONTRACT NUMBER

5b. GRANT NUMBER

5c. PROGRAM ELEMENT NUMBER

6. AUTHOR(S)

Welford C. Roberts, Ph.D. (Editor)

5d. PROJECT NUMBER

5e. TASK NUMBER

5f. WORK UNIT NUMBER

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)

8. PERFORMING ORGANIZATION REPORT NUMBER

9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES)

US Air Force
Office of the Surgeon General
AF/SG9S
5201 Leesburg Pike
Falls Church, VA 22041

10. SPONSOR/MONITOR'S ACRONYM(S)

11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION / AVAILABILITY STATEMENT

Approved for Public Release; distribution is unlimited

13. SUPPLEMENTARY NOTES

14. ABSTRACT

The U.S. Air Force Medical Service presented the fifth annual Air Force Medical Research Symposium coordinated by the Air Force Medical Support Agency's Research and Development Division (AFMSA/SGRS). The symposium was held 24-26 August 2010 at the Doubletree Hotel Washington DC – Crystal City, Arlington, VA. The symposium featured two half-days of plenary sessions, one and a half days of scientific presentations, and a poster session. It was organized into four tracks to include: Operational & Medical, Enroute Care, Force Health Protection, and Nursing. These proceedings are organized into five volumes to include one that provides a general overview and all presentation and poster abstracts; the other four each address a specific track. Volume 5 contains abstracts and presentation slides for the Nursing Track.

15. SUBJECT TERMS

US Air Force, Medical Service, Medical Research, Nursing

16. SECURITY CLASSIFICATION OF:			**17. LIMITATION OF ABSTRACT**	**18. NUMBER OF PAGES**	**19a. NAME OF RESPONSIBLE PERSON**
					Nereyda Sevilla
a. REPORT	**b. ABSTRACT**	**c. THIS PAGE**	SAR	34	**19b. TELEPHONE NUMBER** *(include area code)*
U	U	U			703-681-6383

Standard Form 298 (Rev. 8-98)
Prescribed by ANSI Std. Z39.18

Proceedings of the 2010 AFMS Medical Research Symposium
Volume 5. Nursing Track Abstracts and Presentations

Volume 5 of 5

Proceedings of the 2010 AFMS Medical Research Symposium Volume 5. Nursing Track Abstracts and Presentations

Edited by: Dr. Welford C. Roberts

Held
24-26 August 2010
at the
DoubleTree Hotel Washington DC – Crystal City
300 Army Navy Drive
Arlington, VA 22202

Table of Contents

Proceedings of the 2010 AFMS Medical Research Symposium

Introduction

The U.S. Air Force Medical Service presented the fifth annual Air Force Medical Research Symposium coordinated by the Air Force Medical Support Agency's Research and Development Division (AFMSA/SGRS). The symposium was held on 24-26 August 2010 in the Washington D.C. area at the Doubletree Hotel Washington DC – Crystal City in Arlington, VA. The symposium featured two half-days of plenary sessions, one and a half days of scientific presentations, and a poster session.

The symposium was organized into several tracks to include Operational & Medical, En-route Care, Force Health Protection, and Nursing, as follows:

- The Operational & Medical Track focused on patient care and treatment in garrison, expeditionary care during contingency operations, and enhancing performance of airman in challenging environments.
- The En-route Care Track addressed science and technology targeted at the continuum of care during transport from point of injury to definitive care to include medivac, aeromedical evacuation, critical care air transport, patient staging, and patient safety.
- The Force Health Protection Track focused on prevention of injury and illness and the early recognition or detection of emerging threats for in-garrison or deployed operations. Topics of interest include research in bio-surveillance, infectious disease, emerging threats (pandemic response), protective countermeasures, disaster response/consequence management, toxicology/health risks (e.g., particulates nanomaterials, radiation, etc.), monitoring disease trends, other areas of preventive medicine, public and environmental health relevant to the military workforce.
- The Nursing Track focused specifically on evidence based practice.

These proceedings are organized into five volumes, as follows:

- Volume 1. This volume is a general overview of the entire 2010 Air Force Medical Research Symposium and includes abstracts of all the oral presentations and posters. First presented is the symposium's opening plenary session, followed by the abstracts from the four technical tracks, and then the closing plenary session. The abstracts associated with the poster session are in the last section of these proceedings. The agenda for the overall symposium is in Appendix A, attendees are listed in Appendix B, and continuing education information is in Appendix C of this volume. Appendices D-L are copies of presentation slides from the plenary sessions.
- Volume 2. This volume contains abstracts and presentation slides for the Operational & Medical Track.
- Volume 3. This volume contains abstracts and presentation slides for the En-route Care Track.
- Volume 4. This volume contains abstracts and presentation slides for the Force Health Protection Track.
- Volume 5. This volume contains abstracts and presentation slides for the Nursing Track.

Secondary Insults of Traumatic Brain Injury in CCATT Patients Returning from Iraq/Afghanistan

United States Air Force (USAF), University of Maryland; Baltimore, MD

Maj Susan Dukes

BACKGROUND: Traumatic brain injury (TBI) patients are highly susceptible to secondary insults to the injured brain (e.g., hypoxia, hypotension, hyperthermia, hypothermia, and hyperglycemia). Over one third of the patients transported by Critical Care Air Transport Teams (CCATT) have had TBIs. Considering CCATT patients travel thousands of miles, pass through multiple hospital systems, and are exposed to the stresses of flight on military cargo aircraft, the occurrence and timing of these secondary insults need to be explored. PURPOSE: This study describes the occurrence of secondary insults in isolated TBI patients transported by CCATTs from the point of injury to arrival in the United States between 2001 and 2006. METHODS: A descriptive retrospective cohort design was used to conduct a secondary analysis of 64 CCATT patients with isolated TBI from the Wartime Critical Care Air Transport Database. Data elements in the database were abstracted from existing records including theater trauma registry, transport documents, flow sheets, and hospital medical records. RESULTS: Over half (52%) of the study patients developed at least one secondary insult before returning to the US. Hyperthermia (47%) followed by hypoxia (27%) occurred at the greatest rates. The greatest occurrence of hyperthermia was reported during the patients' stay at Landstuhl Regional Medical Center (LRMC)(40%) and the CCATT transport from LRMC to the US (41%). The greatest occurrence of hypoxia was reported while the patients were still in theater (30%). Data analysis is ongoing.

Secondary Insults of Traumatic Brain Injury in CCATT Patients Returning from Iraq/Afghanistan: 2001-2006

Susan F. Dukes, PhD, CCRN, CCNS
LtCol (sel), USAF, NC
24 August 2010

Background

- 1.5 million new cases of TBI/year (Hickey & Prator, 2009)
  - Highly susceptible to secondary insults
  - Those with secondary injury have worse outcomes
- Secondary Insults – later causes that can lead to additional insult to the injured brain
  - Include: hypoxia, hypotension, hyperthermia, hypothermia, hyperglycemia
  - Goal is prevention
- TBI "signature injury" of OIF/OEF (Hoge, et al., 2008)

A Patient's Trip Home

1. Point of injury to theater hospital
2. Care at the theater hospital
   - "In theater" 28 hours (Johannigman, 2008)
3. CCATT from theater hospital to Germany
   - Theater to Germany over 6 hours (Bridges & Evers, 2009)
4. Care in Germany
   - ICU stay at Germany 72 hours (Fang et al., 2009)
5. CCATT from Germany to USA
   - Germany to USA 8-14 hours (Richardson, 2007)
   - Point of wounding to USA 8.5 days (Fox et al., 2005)

The CCATT Environment

CCATT Nurse and Patient on C-17 (Pierce & Evers, 2003)

Preparing for Patients on C-141

Secondary Insults

- Hypoxia
  - Prevalence 11–57% (Jiang et al., 2002; Stocchetti et al., 1996)
- Hypotension
  - Prevalence 9–68% (Chi et al., 2006; Jeremitsky et al., 2003)
- Hypothermia
  - Accidental or intentional
  - Prevalence 5–10% on admission; 26% in first 24 hours (Wang et al., 2005; McHugh et al., 2007; Jeremitsky et al., 2005)
- Hyperthermia
  - Prevalence 25–73% (Jiang et al., 2002; Stocchetti et al., 2002)
- Hyperglycemia
  - Prevalence 33–48% (Lam et al., 1991; Young et al., 1989)

Specific Aims

1. Describe the occurrence of secondary insults (hypoxia, hypotension, hyperthermia, hypothermia, and hyperglycemia) in isolated TBI patients transported by CCATTs.
2. Determine if the occurrence of secondary insults in isolated TBI CCATT patients is associated with:
   - extent of injury (Injury Severity Score)
   - etiology of TBI (blast vs. non-blast injury)
   - type of aircraft used for transport (C-17 vs. C-141)
   - year of occurrence (from beginning of OIF/OEF to most recent available data)

Methods

- Design – Retrospective cohort design using Wartime Critical Care Air Transport database
- Sample – isolated TBI CCATT patients
- Measures
  - Injury characteristics
  - Timing of injury and transport
  - Physiologic data
- Human Subjects Protection
  - De-identified secondary data with dates
  - UMD expedited IRB

Wartime Critical Care Air Transport Database

- Patients transported by CCATTs
- October 2001 through May 2006
- Multiple sources
- Point of injury to 7 days after arriving in U.S.
- Isolated TBI Patients
  - Population of 67
  - 3 no physiologic study variables recorded
  - Final N=64
  - 2,623 variables
  - Longitudinal record created for each study patient
- Missing data

Demographic Characteristics

Characteristic		Mean ± SD or N (%)
Age		27 ± 8
Service	Army	44 (69)
	Marine Corp	12 (19)
Injury Severity Score		17 ± 8
Mechanism	Blast	34 (53)
Year	2003	7 (11)
	2004	24 (38)
	2005	25 (39)
	2006 (thru May)	8 (13)

Characteristics over 4 Years

DV	N	KW	df	p
Days from Injury to Germany	**56**	**19.1**	**3**	**<.001**
Days from Injury to USA	**43**	**18.5**	**3**	**<.001**
ISS	59	4.2	3	.241
Age	64	3.4	3	.335

- Injury to Germany
  - 2004 median time 2.5 days
  - 2005 and 2006 median time 1.0 days
- Injury to USA
  - 2003 and 2004 median time 8 days
  - 2006 median time 3.5 days
- Blast/Non-Blast – no change over the 4 years

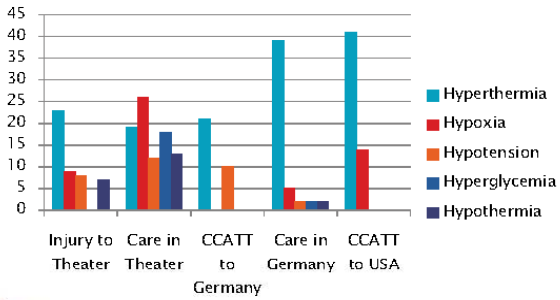
Additional Demographic Findings

- Equal distribution of C-141 and C-17 aircraft for both legs of CCATT transports
- Significant correlation between year and type of aircraft used for both CCATT transport legs
  - Year by aircraft from theater to Germany
    τ=.56, p<.001
  - Year by aircraft from Germany to USA
    τ=.40, p=.01
  - C-141 most common early on
  - C-17 exclusively for both transport legs by 2006

Secondary Insults

Secondary Insult	Pts with SI/Total Pts	%
Hyperthermia	29/62	47
Hypoxia	13/51	25
Hypotension	11/64	17
Hyperglycemia	6/47	13
Hypothermia	5/62	8
None	30/64	47

Percent of Study Patients with Secondary Insults by Leg



Secondary Insult Combinations

- 1 secondary insult (SI) on 1 leg – 20%
- Multiple and/or multiple legs of SI – 33%
- 20 patients had combinations of SI
  - All included hyperthermia
  - Hyperthermia and hypoxia – 25%
  - Hyperthermia and hypotension – 25%
  - Hyperthermia and hyperglycemia – 15%

Factors Predicting Secondary Insults

Determine if the occurrence of secondary insults in isolated TBI CCATT patients is associated with:

- extent of injury (ISS)
- etiology of TBI (blast vs. non-blast injury)
- type of aircraft used for transport (C-17 vs. C-141)
- year of occurrence (from beginning of OIF/OEF to most recent available data)

- Hyperglycemia and combinations did not converge
- Model with hyperthermia as the DV was statistically significant

Factors Predicting Hyperthermia

Variable	*p*	Odds Ratio	95%CI Lower	95%CI Upper
ISS	**.002**	**1.16**	**1.06**	**1.27**
Blast vs. Non-Blast	.455	1.65	0.45	6.06
Year of Injury	.221	2.03	0.65	6.31
CCATT Aircraft Theater to Germany	.428	0.53	0.11	2.58

Summary of Findings

- Decrease in median days from point of injury to Germany and to the USA
- > ½ of the patients had at least one SI
- Hyperthermia most common with occurrence increasing
  - ISS significant predictor of hyperthermia
  - All other SI greatest occurrence while in theater
- No difference in SI by aircraft even with change in primary aircraft
- No difference in SI by year even with time from injury to Germany and USA decreasing

Implications

- Clinical
  - SI are prevalent – educate and prevent
    - Hyperthermia increasing in occurrence
    - Ever vigilant for signs of hypoxia and hypotension on CCATT flights
    - Cognoscente of all SI while still in theater
  - Insight can enhance continuity of care
  - Seek measures to reduce fever and infection explored in the context of the military environment

Implications (continued)

- Policy
  - Transporting pts earlier does not affect SI
  - SI do not vary between C-141 and C-17
  - Develop/implement documentation
    - Follow patients from theater through rehab
    - Include functional outcome measures
- Research
  - SI in polytrauma patients
  - Effects of various blast etiologies
  - Assess new aircraft used by CCATTs

Limitations

- Missing data
- Secondary data
  - No control over variables collected
  - Potential measurement error
- SI may have occurred but not recorded
- Small number of cases
  - Limits predictors
  - Only superficial subgroup analysis
  - Potential Type II error
- Limited outcome data

Strengths

- Wartime Critical Care Air Transport Database only one known of its kind
- Entire population of isolated TBI CCATT pts
- Allows assessment of variables over time
- New area of study – building the body of knowledge of military TBI patients and critical care air transport

Acknowledgements

- Committee
  - Meg Johantgen, PhD, RN – Chairperson
  - Erika Friedmann, PhD
  - Patricia Morton, PhD, FAAN, CRNP
  - George Zangaro, PhD, RN
  - Elizabeth Bridges, PhD, RN, CCNS

(Pierce & Evers, 2003)

Questions

Iron Status of Deployed Military Members

59th CSPG/SGVUS

Maj Candy Wilson

The purpose of this study is to determine the iron status of deployed military personnel, specifically the prevalence of iron deficiency (ID)/iron deficiency anemia (IDA) while stationed at moderate altitude. Iron is a prerequisite for the production of new red blood cells. In the event of reduced availability or iron, one can develop ID and IDA. ID/IDA causes a reduced oxygen carrying capacity. The prevalence of women and men with ID in military training environments is between 11-44% and 3-33%, respectively. ID/IDA has been known to impair physical and cognitive functioning. The research questions are:

What is the iron status of a deployed sample at moderate altitude?

Is there a difference in the prevalence of ID/IDA between deployed men and women?

Is there an increased incidence of ID/IDA in deployed women who have menstruation as compared to deployed women who do not have menstruation?

This study is a descriptive co relational research design. The researchers will examine the relationships between home station altitude, history of anemia, recent blood donation, vegetarian diet choice, and multivitamin us to blood results. For women, researchers will determine if a correlation between menstrual history and iron status exists. Blood analysis will include hematocrit, hemoglobin, mean corpuscle volume, iron, total iron binding capacity, Ferritin, and soluble transferring receptor. The sample will consist of service members deployed greater than three months at Bagram Airfield Afghanistan. The projected sample size is 400 (200 mean, 200 women). ID/IDA is a significant impediment to a fit, healthy, and functioning military force. The identification of risk factors contributing to ID/IDA among active duty U.S. forces in a deployed environment will lead to interventions that improve the combat power and effectiveness of the U.S. military. This study will be completed 30 May 2010.

Develop America's Medical Airmen Today ... for Tomorrow

Iron Status of Deployed Military Members

Candy Wilson, Major, USAF, NC
Michael D. Brothers, Lt Col, USAF
James P. McClung, PhD

Providing Great Care...Building Warrior Medics

Develop America's Medical Airmen Today ... for Tomorrow

Disclaimer

- The views of this presentation are those of the author and not of the US Air Force, Department of Defense or the United States Government.

Providing Great Care...Building Warrior Medics

Develop America's Medical Airmen Today ... for Tomorrow

Thank you

- This study funded by:
  - TriService Nursing Research Program
  - Air Force Surgeon General
- Institute of Surgical Research
- Joint Combat Casualty Research Team

Providing Great Care...Building Warrior Medics

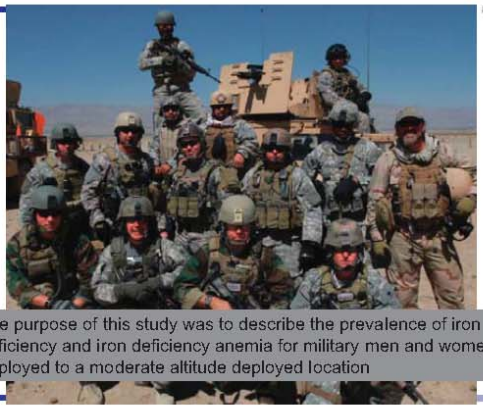
Develop America's Medical Airmen Today ... for Tomorrow

Background

- Iron is a prerequisite for production of RBCs
- Iron is stored in the liver, bone marrow, and spleen as ferritin
- Reduced availability results in iron deficiency (ID) and iron deficiency anemia (IDA) which impairs physical and cognitive functioning
- Losses occur through GI tract, skin, urine, and for females, menstruation

Providing Great Care...Building Warrior Medics

Purpose



The purpose of this study was to describe the prevalence of iron deficiency and iron deficiency anemia for military men and women deployed to a moderate altitude deployed location

Research Questions

1. What is the iron status in a deployed sample at moderate altitude?
2. Is there a difference in the prevalence of iron deficiency and iron deficiency anemia between deployed men and women?
3. Is there an increased prevalence of iron deficiency and iron deficiency anemia in women who have menstruation as compared to women who do not have menstruation?

Significance

- Iron is the only micro deficiency in developed countries
- Prevalence of ID in military training
  - Men 3-33%
  - Women 11-44%
- Acclimatization and the demanding military deployed environment may result in poorer physical and cognitive performance

Study Design & Setting

Sampling Plan

Develop America's Medical Airmen Today ... for Tomorrow

- **Inclusion Criteria**
  - Men and Women deployed to Bagram Airfield, Afghanistan
  - Work at Bagram Airfield, Afghanistan
  - Stationed in theater for more than three months
- **Exclusion Criteria**
  - Subjects with known anemia from other diagnses, such as sickle cell anemia, thalassemia, etc.
  - Military members lass than 18 years of age

Providing Great Care...Building Warrior Medics

Instruments

Develop America's Medical Airmen Today ... for Tomorrow

- Data Collection sheet:
  - Time in theater
  - Age
  - Sex
  - Zip code deployed from
  - History of iron deficiency anemia
  - Blood donation history
  - Vegetarian status
  - Multivitamin and iron supplement use

Providing Great Care...Building Warrior Medics

Instruments

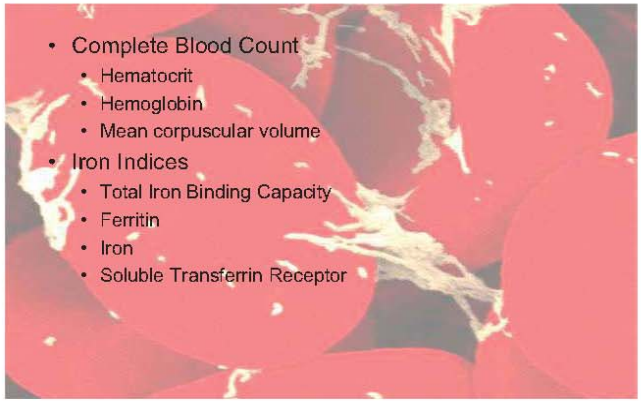
Develop America's Medical Airmen Today ... for Tomorrow

- Menstrual History questionnaire
  - Have regular periods
  - Date of last menses
  - Days menstruate
  - Days between menstruation
  - Days of heavy flow
  - Using birth control
  - Change in menstruation since deployment

Providing Great Care...Building Warrior Medics

Instruments

Develop America's Medical Airmen Today ... for Tomorrow



Data Analysis

Develop America's Medical Airmen Today ... for Tomorrow

- Descriptive
- T-test
- Chi-square
- Correlation
- Multivariate logistic regression models

Providing Great Care...Building Warrior Medics

Operational Definitions

Develop America's Medical Airmen Today ... for Tomorrow

Laboratory Test	Normal Range	Iron Deficiency	Iron Deficiency Anemia
Hematocrit	38-50%	38-50%	<38%
Hemoglobin	12-16 g/dL	12-16 g/dL	<12 g/dL
Mean corpuscular volume	80-100 fL	Normal range or <80 fL	<80 fL
Total Iron Binding Capacity (TIBC)	330±30 mcg/dL	360-410 mcg/dL	≥410 mcg/dL
Ferritin	100±60ng/mL	≤20 ng/mL	<12 ng/mL
Iron	115±50 µg/dL	<115 µg/dL	< 40 µg/dL
Soluble transferrin receptor	<35 mg/dL	≥ mg/dL	≥ 35 mg/dL

Providing Great Care...Building Warrior Medics

Sample Demographics

Develop America's Medical Airmen Today ... for Tomorrow

Providing Great Care...Building Warrior Medics

Sample Demographics

Develop America's Medical Airmen Today ... for Tomorrow

Average Age Men	*M* = 35, *SD* = 9.5 (149 men)
Average Age Women	*M* = 33, *SD* = 10.2 (145 women)
Avg time in theater	*M* = 180 days, *SD* = 66
History of Anemia	39 women (27%)
History of Blood Donation	22 members (all platelets)
Vegetarian	2 members (<1%)
Multivitamin Use	87 members (29%)
Iron Supplements	3 members (1%)

Providing Great Care...Building Warrior Medics

Menstrual Status

Develop America's Medical Airmen Today ... for Tomorrow

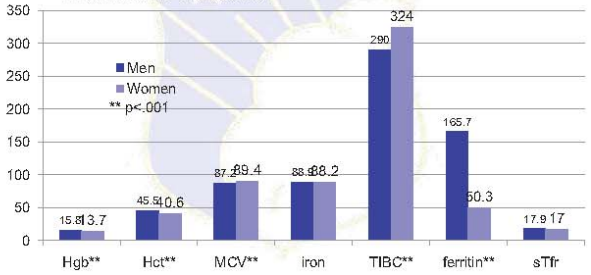
Regular menses	109 women (75%)
Using Birth Control	43 women (39%)
Change in menses	54 women (50%)
How stop menses	
Birth control	19 (54%)
Surgery	6 (17%)
Menopause	10 (29%)

Providing Great Care...Building Warrior Medics

Results

Develop America's Medical Airmen Today ... for Tomorrow

What is the iron status in a deployed sample at moderate altitude?



Providing Great Care...Building Warrior Medics

Results

Develop America's Medical Airmen Today ... for Tomorrow

Is there a difference in the prevalence of iron deficiency and iron deficiency anemia between deployed men and women?

ID: 8 Women (6% women)

IDA: 1 man,(<1%) , 7 women (5%)

Providing Great Care...Building Warrior Medics

Results

Develop America's Medical Airmen Today ... for Tomorrow

Is there an increased prevalence of ID and IDA in women who have menstruation as compared to women who do not have menstruation?

ID: 1 no menses; 7 with menses

IDA: 7 with menses

n = 145

Providing Great Care...Building Warrior Medics

Discussion

Discussion

- The incidence of IDA is similar to US population statistics (CDC Reported Men <1%, Women 3-4%)
- It is possible that plasma volume shift occurred with acclimatization to moderate altitude. Moderate altitude normal range laboratory values are needed for clinical care.

Limitations

- The convenience sample limited the ability to analyze trends of iron depletion in specific career fields that require intense physical activity.
- Numerous obstacles delayed the shipment of plasma samples from the Afghanistan theater.

Implications

- Clinical care for military members with signs of symptoms of ID and IDA cannot be ignored
- Future research needed to determine moderate altitude laboratory norms
- Future studies need to compare iron status prior to deployment and during deployment within the same individuals to determine if there is an effect on iron stores during deployment.

Deployed Women's Health

Develop America's Medical Airmen Today ... for Tomorrow

Nurses need to continue to advocate for menstrual suppression

Providing Great Care...Building Warrior Medics

Questions or Comments

"Providing Great Care…Building Warrior Medics"

Develop America's Medical Airmen Today ... for Tomorrow
Providing Great Care...Building Warrior Medics

Air Force Nurse Transition Program

88th MDG

Col Robie Hughes

BACKGROUND: The Air Force Nurse Transition program was established in 1977 for Air Force nurse accessions with less than one year of clinical experience as a registered nurse. Today the program is held at 8 military and 2 civilian training sites. The course length varies according to location. At military training sites the course length is 11 weeks long. At the civilian locations (Cincinnati and Scottsdale) the course has been reduced to 9 weeks because students completed clinical skills requirements quicker due improved access to patients. No research studies on the measurement of nursing performance related to the Air Force Nurse Transition program has been published. SPECIFIC AIMS: 1) Implement valid and reliable instruments to measure nurse transition student performance during medical simulation scenarios. (2) Establish base line data on new nurse accessions' performance upon entrance to the military and prior to attending the Air Force Nurse Transition Program based on the simulation scenario evaluation instruments.(3) Determine the impact of the Air Force Nurse Transition Program on graduates' performance during medical simulation scenarios based on the Simulation Evaluation Instrument. (4) Compare military nurses enrolled in the Air Force Nurse Transition Program at civilian training sites to those at the military training sites in terms of pre and post attendance subscale scores on the simulation scenario evaluation instruments. METHOD: Samples (multisite) Repeated Measurement Pre-test/Posttest Comparative design. Each group at one of 10 sites is evaluated using a simulated medical scenario prior to attending and upon completion of the Air Force Nurse Transition Program. No control group will be used for this study because it is not feasible to have a "no training" group, nor to have subjects act as their own control for the same length of time (9 to 11 weeks) as in the training program. Findings: To be determined. At the time of the AFMS Symposium, 8 classes of NTP students (28 total classes projected for FY 10) will have gone through the study pre and post NTP. Data collected from the 8 classes will be presented as findings during the presentation. DISCUSSION: Information will be discussed regarding the partial findings from this study. The data collection will continue through 17 Dec 10.

Headquarters U.S. Air Force

Integrity - Service - Excellence

Air Force Nurse Transition Program Student Quantitative Medical Simulation Performance

Colonel Vickie Hughes
August 2010

Year of the Air Force Family

"The views and opinions expressed in this presentation are those of the author and do not reflect official policy or position of the United States Air Force, Department of Defense, or US Government."

History of AF NTP

Year of the Air Force Family

- 1977
  - 20-week internship at 5 sites (Nurse Intern Program)
  - Nurses 'selected' to attend
- 1988
  - Centralized under direction of Sheppard AFB
- 1994
  - Major revision: 12-week transition at 6 sites
- 2004
  - 11-week transition at 9 sites
  - Med-Surg & OB tracks added

Integrity - Service - Excellence

History of the AF NTP

Year of the Air Force Family

- 2008
  - 2 Civilian training platforms approved
    - Cincinnati (activated 2008)
    - Scottsdale (activated 2009)
  - Gained higher acuity/complexity
    - Reduced to 9 weeks
- 2010
  - Andrews Phase II site closing
  - 10 sites active

I'M GROWING

Integrity - Service - Excellence

Review of the Literature ...Disconnects!

Year of the Air Force Family

- "According to the Nursing Executive Center research, nearly 90% of academic leaders believe their nursing students are fully prepared to provide safe and effective care, compared with only 10% of the hospital and health system nurse executives"
  - Berkow and Virkstis (2008)
- "Only 35% of new RN grads meet entry level expectations for clinical judgment .... The majority are unable to translate knowledge into practice."
  - Dorothy del Bueno (2005)

Integrity - Service - Excellence

Types of RN Transition Programs

- Nationwide Formal Training Programs
  - University Health System Consortium (UHC)/American Association of Colleges of Nursing (AACN) Nurse Residency Program
  - The Versant RN Residency
  - Vermont Nurses in Partnership
- Federal Sites
  - Air Force NTP 9 weeks civilian site/11 weeks MTF
  - Army 25.5 weeks
  - Navy 10 week program followed by a six week unit-based orientation

Integrity - Service - Excellence 5

NTP Today

- Course Design/Description:
  - Instructional design – individual-paced, didactic/clinical, seminar topics/AF NC officer role
  - Primary focus – gain experience & competence in direct pt care w/preceptor
  - Didactic & clinical components correlated w/ JCAHO, ANA, & AF directives
- NTP Pre-Requisites:
  - Successfully passed NCLEX
  - < 1 year of clinical experience
  - AD commissioned officer (possibly send civilian nurses also)
- # Graduates Annually: 158
- 2010-2011 Expected # NTP Students: 200

Integrity - Service - Excellence 6

Aims of NTP Study

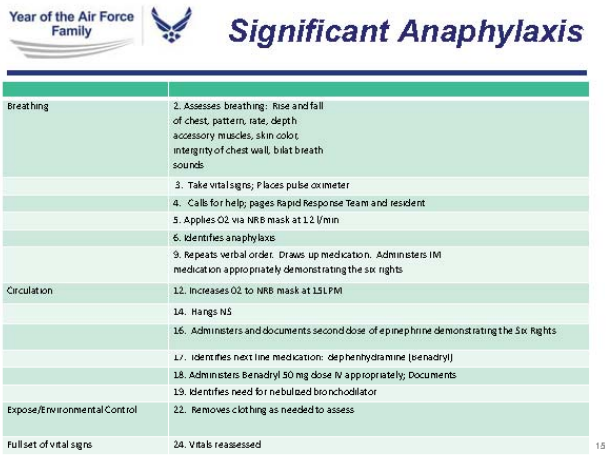
- Implement valid & reliable instruments to measure NTP student performance during medical simulation scenarios
- Establish baseline data on new nurses' performance
- Determine impact of NTP on graduates' performance during medical simulation scenarios
- Compare NTP graduate performance at civilian training sites to NTP graduates at military sites
  - Pre- and post- attendance subscale scores on SSEI

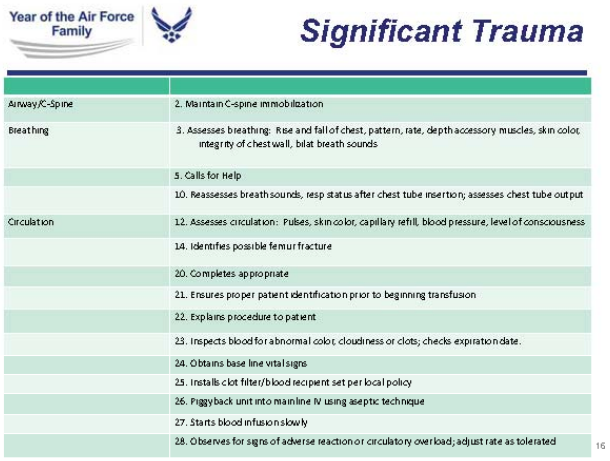
Integrity - Service - Excellence 8

Statistical Analysis

- Inter Rater Reliability
  - Cohen's Overall Kappa = 0.78 which is indicative of very good overall agreement among the raters, regardless of site, for pre-post ratings
- Raters were consistent across time and site

Integrity - Service - Excellence 14


Year of the Air Force Family
Significant Anaphylaxis
Breathing
2. Assesses breathing: Rise and fall of chest, pattern, rate, depth accessory muscles, skin color, intergrity of chest wall, bilat breath sounds
3. Take vital signs; Places pulse oximeter
4. Calls for help; pages Rapid Response Team and resident
5. Applies O2 via NRB mask at 12 l/min
6. Identifies anaphylaxis
9. Repeats verbal order. Draws up medication. Administers IM medication appropriately demonstrating the six rights
Circulation
12. Increases O2 to NRB mask at 15 LPM
14. Hangs NS
16. Administers and documents second dose of epinephrine demonstrating the Six Rights
17. Identifies next line medication: dephenhydramine (benadryl)
18. Administers Benadryl 50 mg dose IV appropriately; Documents
19. Identifies need for nebulized bronchodilator
Expose/Environmental Control
22. Removes clothing as needed to assess
Full set of vital signs
24. Vitals reassessed
15


Year of the Air Force Family
Significant Trauma
Airway/C-Spine
2. Maintain C-spine immobilization
Breathing
3. Assesses breathing: Rise and fall of chest, pattern, rate, depth accessory muscles, skin color, integrity of chest wall, bilat breath sounds
5. Calls for Help
10. Reassesses breath sounds, resp status after chest tube insertion; assesses chest tube output
Circulation
12. Assesses circulation: Pulses, skin color, capillary refill, blood pressure, level of consciousness
14. Identifies possible femur fracture
20. Completes appropriate
21. Ensures proper patient identification prior to beginning transfusion
22. Explains procedure to patient
23. Inspects blood for abnormal color, cloudiness or clots; checks expiration date.
24. Obtains base line vital signs
25. Installs clot filter/blood recipient set per local policy
26. Piggyback unit into mainline IV using aseptic technique
27. Starts blood infusion slowly
28. Observes for signs of adverse reaction or circulatory overload; adjust rate as tolerated
16

Inpatient Glycemic Management Team at Wilford Hall Medical Center

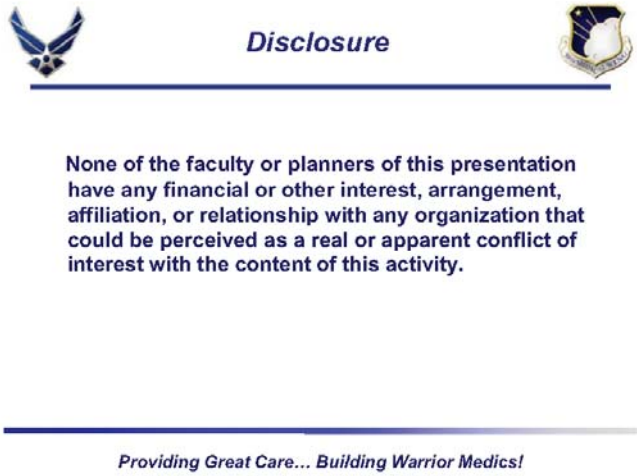
Wilford Hall Medical Center (WHMC)

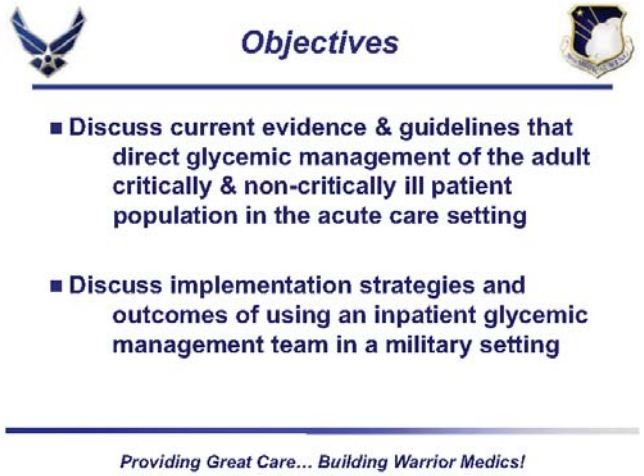
Stacey Ward, MSN, RN, CNS-BC, BC-ADM, Lexa Rijos, MSN, RN, ACNP-BC, Linh Reeves, MPAS, PA-C, Joe Pollard, MPH, Mark W. True, MD, and Brian T. Allenbrand, MD

Best practices direct hyperglycemic management in the acute care setting to be at the forefront of providing quality care for either hospitalized diabetic or non-diabetic patients. As demonstrated by current research, sustained hyperglycemia results in increased hospital length of stays and infection rates. As part of the American Diabetes Association and The Joint Commission inpatient diabetes recognition program, an attribute for success is having an identified program champion team. In August, 2009 Wilford Hall Medical Center, an Air Force medical center in San Antonio, TX, formed an inpatient glycemic management team (IGMT) comprised of mid-level providers to include a nurse practitioner (NP), physician assistant (PA), and clinical nurse specialist (CNS). One role of the team is to consult and provide recommendations for glycemic management strategies in the critically and non-critically ill patients while monitoring blood glucose rates for hypoglycemia (< 70 mg/dl). From September 2009 to February 2010, the rate of acceptance of recommendations provided was 90.2%. Comparing September 2008- February 2009 to September 2009 -February 2010 for overall hypoglycemia in the non-critically ill was 2.4% and 1.7%, and hyperglycemia (> 180 mg/dl) was 31% and 30%, respectively while the critically ill population had an overall rate of hypoglycemia of 1.7% and 1.5%, respectively. As evidenced by an overall acceptance of recommendations demonstrating a decline in hypoglycemia and hyperglycemia rates, using an IGMT to direct inpatient hyperglycemic care is an effective methodology of providing best practices for this patient population.


59th Medical Wing
Providing Great Care – Building Warrior Medics!
Inpatient Glycemic Management Team at WHMC
59TH MEDICAL WING
Stacey Ward, MSN, RN, CNS-BC, BC-ADM
UPMC/WHMC Adult Inpatient Glycemic Management Team CNS
59th Medical Wing (WHMC)


Abstract Co-Authors
Lexa Rijos, MSN, RN, ACNP-BC
Linh Reeves, MPAS, PA-C
Joe Pollard, MPH
Mark W. True, MD
Brian T. Allenbrand, MD
Providing Great Care... Building Warrior Medics!


Disclosure
None of the faculty or planners of this presentation have any financial or other interest, arrangement, affiliation, or relationship with any organization that could be perceived as a real or apparent conflict of interest with the content of this activity.
Providing Great Care... Building Warrior Medics!


Objectives
Discuss current evidence & guidelines that direct glycemic management of the adult critically & non-critically ill patient population in the acute care setting
Discuss implementation strategies and outcomes of using an inpatient glycemic management team in a military setting
Providing Great Care... Building Warrior Medics!

Introduction
Diabetes in the 21st Century

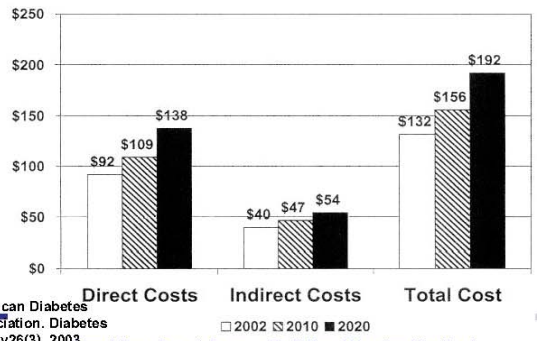
- Diabetes affects almost 23.6 million Americans
- 5.7 million people (or nearly one quarter) are unaware that they have diabetes
- 65% of deaths among people with diabetes result from heart disease and stroke
- Diabetes is the leading cause of nontraumatic amputation, new blindness and kidney failure

www.diabetes.org

Providing Great Care... Building Warrior Medics!

Projected Impact of Changing Demographic Characteristics on the National Cost of Diabetes: 2002-2020 (in 2002 billions of dollars)

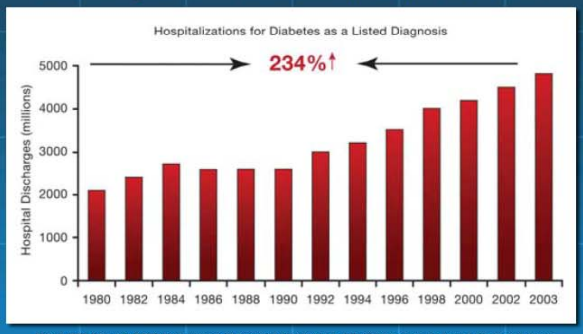
Almost $1 of every $5 spent on health care in the U.S. is for a person with diabetes



American Diabetes Association. Diabetes Care, v26(3). 2003.

Providing Great Care... Building Warrior Medics!

Number (in Thousands) of Hospital Discharges with Diabetes, US, 1980–2003



From 1980 through 2003, the number of hospital discharges with diabetes as any-listed diagnosis more than doubled (from 2.2 million to 5.1 million discharges)

CDC. Available at http://www.cdc.gov/diabetes/statistics/dmany/fig1.htm. Accessed March 5, 2006

AACE Inpatient Glycemic Control Resource Center

Hyperglycemia Statistics

- Definition
- Present on 38% of admitted patients
- Further breakdown:
  - 26% had known hx of DM
  - 12% with no hx of DM

Umpierrez, G.E., et al. (2002)

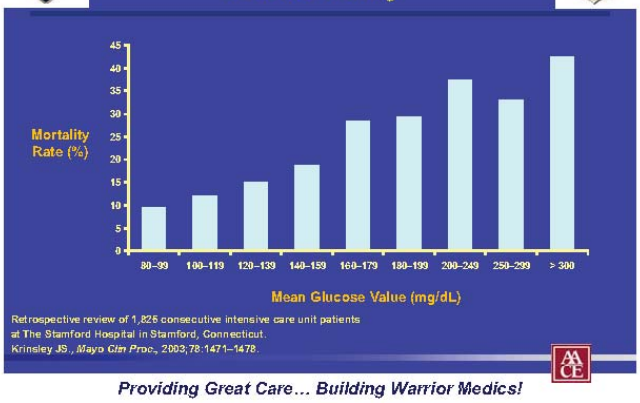
Providing Great Care... Building Warrior Medics!

Background

- Multiple trials have shown a strong association between hyperglycemia and worsened patient outcomes

Providing Great Care… Building Warrior Medics!

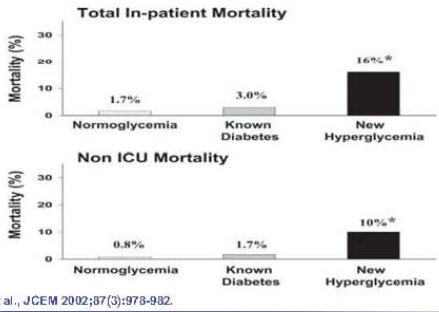
Hyperglycemia and ICU Mortality



Retrospective review of 1,826 consecutive intensive care unit patients at The Stamford Hospital in Stamford, Connecticut.
Krinsley JS., *Mayo Clin Proc.*, 2003;78:1471–1478.

Providing Great Care… Building Warrior Medics!

Hyperglycemia and Non-Critically Ill Mortality



Umpierrez et al., JCEM 2002;87(3):978-982.

Providing Great Care… Building Warrior Medics!

Organizations supporting Inpatient Glycemic Management

- American Diabetes Association
- Society of Hospital Medicine
- Veterans Health Administration
- American Association of Clinical Endocrinologists
  - Inpatient glycemic control resource center
- Texas Diabetes Council (Texas Department of State Health Services)
  - The Diabetes Tool Kit 5th Ed.

Providing Great Care… Building Warrior Medics!

Multidisciplinary Approach for Steering Committee

- Member composition:
  - Champion endocrinologist
  - Mid-level providers who may comprise glycemic team
  - Quality improvement
  - Administration
  - Various medical leaders from different services
  - Nutrition
  - Information Systems
  - Pharmacy
  - POC lab personnel
  - Nursing:
    - Mid-level leadership
    - Clinical

Providing Great Care... Building Warrior Medics!

Various Models

- Consultant
- System-wide
- Diabetes

Providing Great Care... Building Warrior Medics!

Model Used

- WHMC IGMT composition:
  - Champion endocrinologist
  - Mid-level providers
    - Clinical Nurse Specialist
    - Acute Care Nurse Practitioner
    - Physician Assistant

Providing Great Care... Building Warrior Medics!

Roles/Responsibilities of IGMT at WHMC

- Daily review of BGs <70mg/dl and > 180 mg/dl to identify patients who require evaluation
- Daily rounds on both critically and non-critically-ill settings who are included in above BG ranges & derive medical management strategies (i.e. insulin dosing regimens whether intravenous or subcutaneous)
- Daily reevaluates patient status for changes (i.e. dietary intake, renal function) in order to customize insulin dosing recommendations
- Collaborates with providers and nursing staff on medical management of each patient

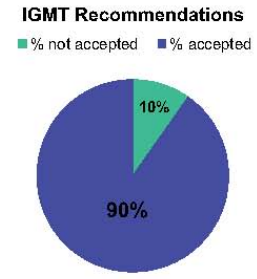
Providing Great Care… Building Warrior Medics!

Roles/Responsibilities of IGMT at WHMC

- Identifies and provides discharge education to include diabetes survival skills for newly-diagnosed diabetics on home insulin use and any other patients requiring education
- Participates in the formatting and approval process of all policies and procedures directing use of all inpatient insulin protocols current & future
- Provides educational inservices to medical and nursing staff on a regular basis regarding inpatient insulin protocols
- Develops process-improvement strategies in response to issues related to protocol implementation and utilization

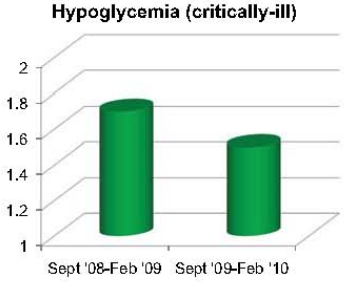
Providing Great Care… Building Warrior Medics!

Statistics of IGMT



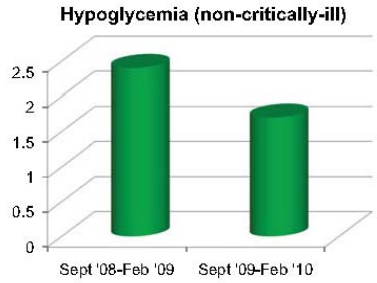
Providing Great Care… Building Warrior Medics!

Statistics of IGMT



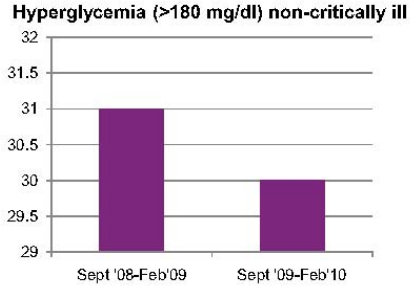
Providing Great Care… Building Warrior Medics!

Statistics of IGMT



Providing Great Care… Building Warrior Medics!

Statistics of IGMT



Providing Great Care… Building Warrior Medics!

Barriers

- Fear of hypoglycemia
- Long-standing practice patterns (usage of sliding scale as sole means of glycemic management)
- Unpredictable patient eating patterns
- Deployment of large numbers of staff (medical, nursing, and medical technicians) every six months
- Alteration of administrative infrastructure related to deployments
- Paper charting system

Providing Great Care… Building Warrior Medics!

Future Plans

- Protocols
  - Insulin pump
  - Steroid-induced hyperglycemia
  - Peri-operative
- Transition current process to SAMMC formerly known as Brooke Army Medical Center (BAMC)
- Continued process improvement of protocols

Providing Great Care… Building Warrior Medics!

Summary

- Overall acceptance of recommendations
- Demonstrated decreased hypoglycemia & hyperglycemia rates for critically & non-critically ill populations
- IGMT effective methodology for providing best practices of inpatient glycemic management

Providing Great Care… Building Warrior Medics!

Contact Information

- E-mail:
  - Stacey.ward.ctr@lackland.af.mil

Providing Great Care… Building Warrior Medics!

QUESTIONS?

59TH MEDICAL WING

Providing Great Care… Building Warrior Medics!

Diabetes Self-Management Education at a Military Hospital

University of Pittsburgh Medical Center (UPMC)

Ellen Kilpatrick, RN, CDE, Nina Watson, RN, CDE, Joseph Pollard, MPH; Acknowledgements: Linda Siminerio*, RN, PhD, Kristine Ruppert*, DrPH

BACKGROUND: Diabetes self-management education (DSME) is considered to be an important part of management and has been directly associated with a decrease in HbA1c levels. Patients who do not receive DSME are found to be four times more likely to develop a major complication and incur higher diabetes-related hospital costs. Self-management is considered to be a key component of the Chronic Care Model (CCM). As part of our effort to deploy the CCM in a military environment, we established a Diabetes Center of Excellence (DCE) at Wilford Hall Medical Center (WHMC) for high risk diabetes patients. The DCE included an ADA recognized program. Our objective was to determine the impact of DCE patients who received DSME on HbA1c levels. METHODS: Patient military beneficiaries who received DSME between January and December 2009 with at least 1 recorded baseline and follow-up HbA1c were included in the analysis. RESULTS: A total of 207 patients (mean age 58 years, 51% male, 43% Caucasian, 29% Hispanic, and 22% African American) participated. Prior to program 39.6%; post program 17.4% had HbA1C >8%, representing an overall 1.1% HbA1c reduction. 69.6% of patients showed improvements. After adjusting for pre HbA1c and race, completing the DSME classes showed a significant decrease (p=0.001). CONCLUSIONS: These findings demonstrate the added benefit of integrating a formal DSME program in diabetes specialty clinics for military beneficiaries. DSME can be considered an important adjunct in diabetes specialty care.

Diabetes Self-Management Education at a Military Hospital

Ellen Kilpatrick, RN, CDE
Nina Watson, RN, CDE
Joseph Pollard, MPH

Acknowledgements:
Linda Siminerio, RN, PhD
Kristine Ruppert, DrPH

Disclosure

- None of the faculty or planners of this presentation have any financial or other interest, arrangement, affiliation, or relationship with any organization that could be perceived as a real or apparent conflict of interest with the content of this activity

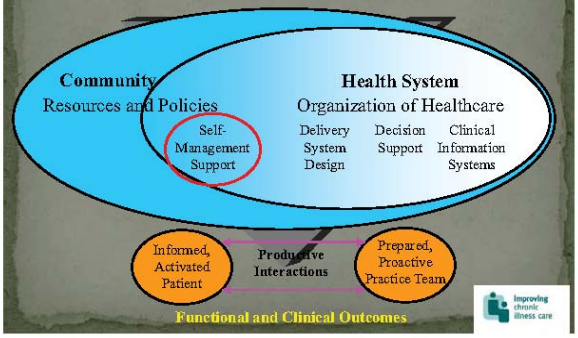
Background

Diabetes Self-Management Education:

- Important part of management
- Directly associated with decrease in HbA1c levels (0.76%)
- Patients who do not receive DSME are 4 times more likely to develop a major complication and incur diabetes related hospital costs

Norris SL, et al. Effectiveness of self-management training on type 2 diabetes: a systematic review of randomized controlled trials. *Diabetes Care*. 2001. Brown AS. Interventions to promote diabetes self-management: state of the science. Diabetes Educator 1999.

The Chronic Care Model



Objective

- Our objective was to renew ADA recognition
  - Measured A1c values for Quality Assurance
  - Developed content according to ADA requirements

Patient Population:

- Military Beneficiaries
  - Type 1, 2 and pre-diabetes
  - Age 18 and older
  - San Antonio and Surrounding Areas
- Data is reported from:
  - January 2009 – December 2009
- Patients with 1 baseline A1c and at least 1 follow up A1c were included

Methods

Setting and Program:

- Diabetes Self-Management Education
  - Wilford Hall Medical Center
  - Lackland AFB, San Antonio, TX
  - ADA Recognized Program
- Series of 4 classes
  - Offer 2-3 classes weekly
  - 10 classes monthly
  - Total 10 hours of diabetes education

Program Content

- Class 1
  - Type 1 and Type 2 Diabetes
  - Glucose Metabolism
  - Blood Glucose Monitoring
  - Pattern Management
  - Carbohydrate Counting

Program Content

- Class 2
  - Active Lifestyles
  - Incorporating an Exercise Program
  - Impact Exercise Has on Diabetes
  - Hypoglycemia and Treatment
  - Carbohydrate Counting and Label Reading

Program Content

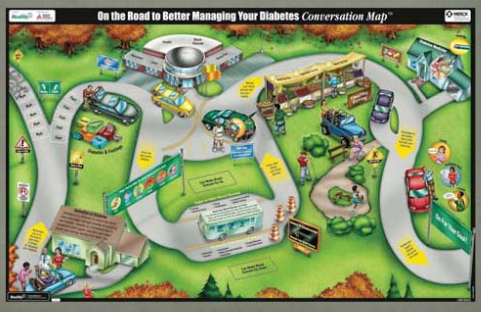
- Class 3
  - Daily Foot Care
  - Foot Exams
  - Retinal Exams
  - Long-Term Complications
  - Frequency and Interpretation of Labwork
  - Goal Setting and Coping Skills

Program Content

- Class 4
  - Medications
  - Insulin Receptors
  - Advanced Carb Counting
  - Managing Diabetes during Illness
  - Restaurant Eating

On the Road to Better Managing Your Diabetes

This Conversation Map covers many of the basic concepts one needs to know as it relates to diabetes and managing diabetes.



Results

- A total of 207 patients participated
  - Mean Age 58 years
  - Gender
    - 51% Male
    - 49% Female
  - Race/Ethnicity
    - 43% Caucasian
    - 29% Hispanic
    - 22% African American

Results

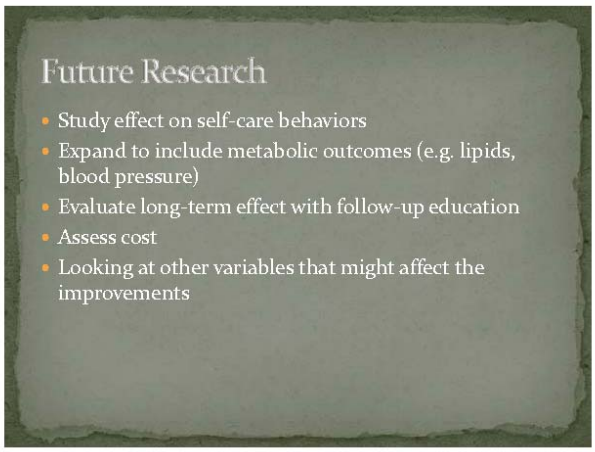
- Overall 1.1% HbA1c reduction
- 69.6% showed improvements in A1c
  - *39.6% of participants had HbA1c > 8% prior to the program*
  - *17.4% of participants had HbA1c > 8% post program*
- After adjusting for pre HbA1c and Race, DSME classes showed a significant decrease (p=0.001)

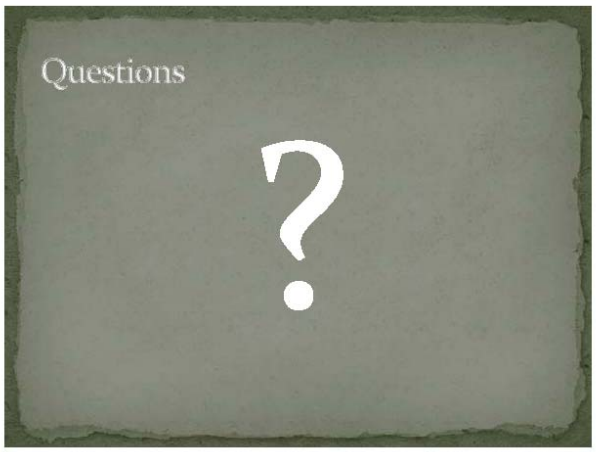
Limitations

- Didn't account for other treatment effects on HbA1c, e.g. medication adjustment, nutrition changes
- Limited to two HbA1c measures
- Limited to measures of glycemia

Conclusion

- DSME is an important adjunct in diabetes specialty care in a military setting
- These findings demonstrate the potential added benefit of integrating a formal DSME program in diabetes specialty clinics for military beneficiaries


Future Research
Study effect on self-care behaviors
Expand to include metabolic outcomes (e.g. lipids, blood pressure)
Evaluate long-term effect with follow-up education
Assess cost
Looking at other variables that might affect the improvements


Questions
?


UNITED STATES AIR FORCE
MEDICAL SERVICE